CLARK COUNTY
STAFF REPORT

DEPARTMENT: Public Works, Transportation

DATE: June 21, 2022

REQUESTED ACTION: Accept the 2021 Annual Bridge Report.

__X__ Consent ____ Hearing ____ County Manager

BACKGROUND
Public Works has completed the Annual Bridge Report for 2021, as required by Washington Administrative Code 136-20-060. The report summarizes the condition of 81 bridges located within Clark County which are owned/operated by Clark County. Of the 81 bridges, 61 are in good condition, 17 are in fair condition, and one is in poor condition. The remaining two bridges are pedestrian bridges, which are not assigned a condition.

In 2021, Public Works completed load-rating evaluations of all 56 qualifying National Bridge Inventory Bridges owned by Clark County. This was in response to changes in federal regulations that added new loading configurations to account for certain types of large hauling vehicles and emergency vehicles that are in use today. Of the 56 load rated bridges, 18 bridges required load restrictions which have been posted accordingly. Additionally, Public Works started load rating non-National Bridge Inventory (non-NBI) Bridges owned by Clark County and evaluated a total of eight bridges. Non-NBI bridges are typically less than 20 feet in length and are not required to be reported. However, these bridges are still actively used for travel and the load ratings are essential for management of the road system.

Clark County was awarded three Federal Highway Bridge Program grants, for a total sum of $5,517,100 to structurally strengthen four load-restricted bridges and to rehabilitate two bridges with abutment or pier foundations that are rated as unstable, known as scour critical bridges. Additionally, Clark County has completed the design phase of structurally strengthening nine load-restricted bridges which will eliminate the existing load restrictions on these bridges. Construction activities are currently planned for the summer of 2022.

COUNCIL POLICY IMPLICATIONS
None.

ADMINISTRATIVE POLICY IMPLICATIONS
None.

COMMUNITY OUTREACH
The Annual Bridge Report will be posted on the Public Works website. Extensive public outreach will be conducted prior to any construction activities.

PW22-139

REVIEWED: LeS

BUDGET IMPLICATIONS

YES	NO	
X		Action falls within existing budget capacity.
	X	Action falls within existing budget capacity but requires a change of purpose within existing appropriation
	X	Additional budget capacity is necessary and will be requested at the next supplemental. If YES, please complete the budget impact statement. If YES, this action will be referred to the county council with a recommendation from the county manager.

BUDGET DETAILS

Local Fund Dollar Amount	N/A
Grant Fund Dollar Amount	N/A
Account	N/A
Company Name	N/A

DISTRIBUTION:
Council staff will post all staff reports to the web. https://www.clark.wa.gov/council-meetings

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ATTACHMENTS: (1) 2021 Annual Bridge Report; (2) 2021 Annual Bridge Report Presentation

Brian Vincent
_____
Brian S. Vincent, P.E.
County Engineer

Sherry Villafane
_____
Sherry Villafane
Public Works Finance Manager

Eva Haney
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Eva Haney, CGFM
Public Works Director

Primary Staff: Brian Vincent, Ext. 1600

APPROVED:_____
CLARK COUNTY, WASHINGTON
CLARK COUNTY COUNCIL

DATE: _____

SR#_____

PW22-139

REVIEWED: LAS

2021 ANNUAL BRIDGE REPORT

CLARK COUNTY
WASHINGTON

PUBLIC WORKS

Submitted by
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County Engineer
Transportation
Division Manager

Prepared by
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Clark County Public Works, Engineer III

Submitted June 2022

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I. INTRODUCTION

This bridge report is prepared by Clark County Public Works Department each year to fulfill the requirements of the Washington Administrative Code (WAC) 136-20-060. The WAC requires:

Each county engineer shall furnish the county legislative authority with a written report of the findings of the bridge inspection effort. This report shall be made available to said authority and shall be consulted during the preparation of the proposed six-year transportation program revision. The report shall include the county engineer's recommendations as to replacement, repair or load restriction for each deficient bridge. The resolution of adoption of the six-year transportation program shall include assurances to the effect that the county engineer's report with respect to deficient bridges was available to said authority during the preparation of the program.

The bridge inspections follow the National Bridge Inspection Standards (NBIS), which are published in the Code of Federal Regulations, 23 CFR 650, subpart C. The NBIS sets national standards forthe proper safety inspection and evaluation of bridges and applies to all structures defined as highway bridges on public roads. The county uses the Washington State Bridge Inspection Manual, which details state policies and procedures for inspecting bridges and assessing their condition.

This report summarizes the county's 2021 bridge program, activities and findings. These programs help prioritize the maintenance and preservation of county bridges and identify complete bridge replacements before they significantly affect the county's transportation network.

II. BRIDGE INVENTORY

There are 81 public bridges that are located throughout Clark County and are owned and operated by Clark County. Out of these 81 public bridges there are 2 pedestrian bridges.

It should be mentioned that in addition to the 81 public bridges owned by the county, there are 27 additional bridges owned by the cities of Vancouver, Camas, Washougal, Ridgefield, Battle Ground, and La Center, and 6 owned by BNSF Railway or Chelatchie Prairie Railroad. This report only covers the 81 public bridges owned and operated by Clark County

Bridges are identified throughout this report by the bridge name followed by the bridge number, e.g., ***Betts Bridge No. 26***. A complete bridge inventory is included in Table A in the Appendix. The following map, *Clark County Bridge Locations Figure 1*, illustrates the distribution of county-owned and city-owned bridges throughout the county, in each councilor's district.

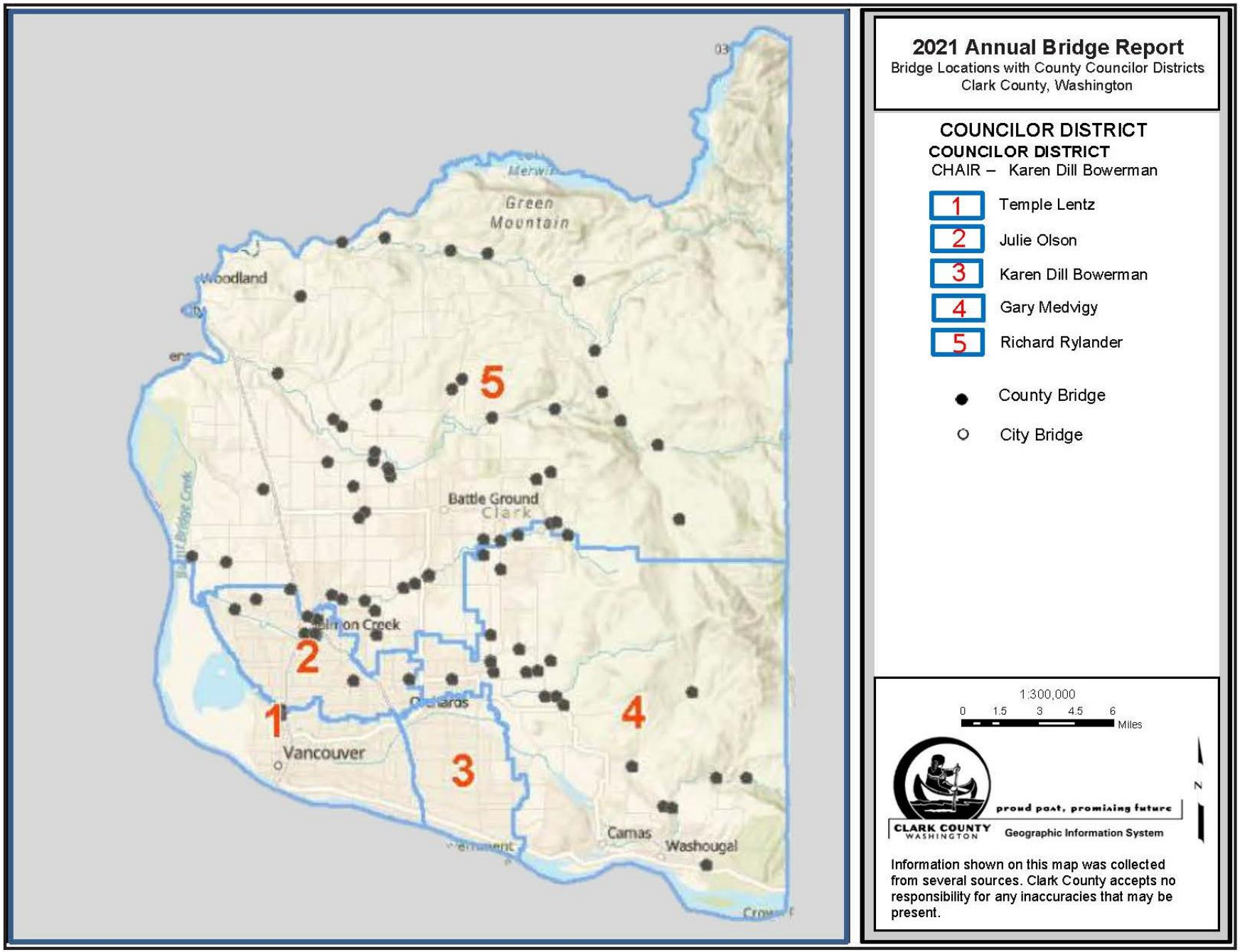


Figure 1 Clark County Bridge Locations Map

Report prepared March 14, 2022

III. BRIDGE INSPECTION FINDINGS AND REPAIRS

A. Bridge Inspection Findings

Manley Middle Culvert No. 901C – Built in 2020

NBIS mandates that public agencies inspect and report on all bridges at least once every two years. Under these standards, the county is required to document and report the current condition of each bridge, determine the degree of wear or deterioration, and recommend repairs or needed services. Deficient bridges, such as load-restricted bridges, may require more frequent inspections.

A total of 43 bridge inspections, were conducted in 2021. During these bridge inspections, inspectors evaluated the condition of the bridge structure and documented any observable deficiencies. When deficiencies were spotted, they were noted in the report and a deficiency report was generated and provided to the Road Maintenance and Operations Division for follow up. Any urgent structural or safety concerns were addressed promptly. No significant findings resulted from this year's routine bridge inspections.

Twelve (12) county bridges are considered scour critical and require special inspection after storms for erosion, debris, and stream bank instability. In 2021, Matney South Bridge No. 169 and Day Break Bridge No. 273 were awarded grants to perform scour mitigation preventative maintenance. Davis Bridge No. 232 has been fully designed and is scheduled to be replaced during the summer of 2022.

The bridge inspection reports are generated, reviewed, and entered into BridgeWorks, a bridge management database developed by the Washington State Department of Transportation (WSDOT) Bridge Preservation office. This database is a master inventory of all structures that are the responsibility of WSDOT. State transportation officials verify that Clark County bridges comply with NBIS standards and report the information to the Federal Highway Administration (FHWA).

One measure that provides an overview of a bridge's condition is the Sufficiency Rating (SR). The SR is a numeric value that indicates a bridge's relative ability to serve its intended purpose. The SR is the summation of four calculated values: Structural Adequacy and Safety, Serviceability and Functional Obsolescence, Essentiality for Public Use, and Special Reductions. A SR is calculated for each bridge using the inspector's ratings for individual features of the bridge. Geometric layout, traffic volume, and the length of a detour route are also used in calculating the SR. The SR ranges from zero (a bridge that is closed and cannot carry traffic loads) to 100 (a new bridge with no deficiencies). The average SR of the entire inventory provides a comparative look at the health of county bridges from one year to the next.

Overall, the average SR for the county inventory of bridges over the past 14 years ranged from a low of 75.2% in 2010 and 2011 to a high of 77.4% in 2018, with an average SR of 76.4 in 2021. Figure 2 illustrates a histogram of the average annual SR over each of the past 14 years.

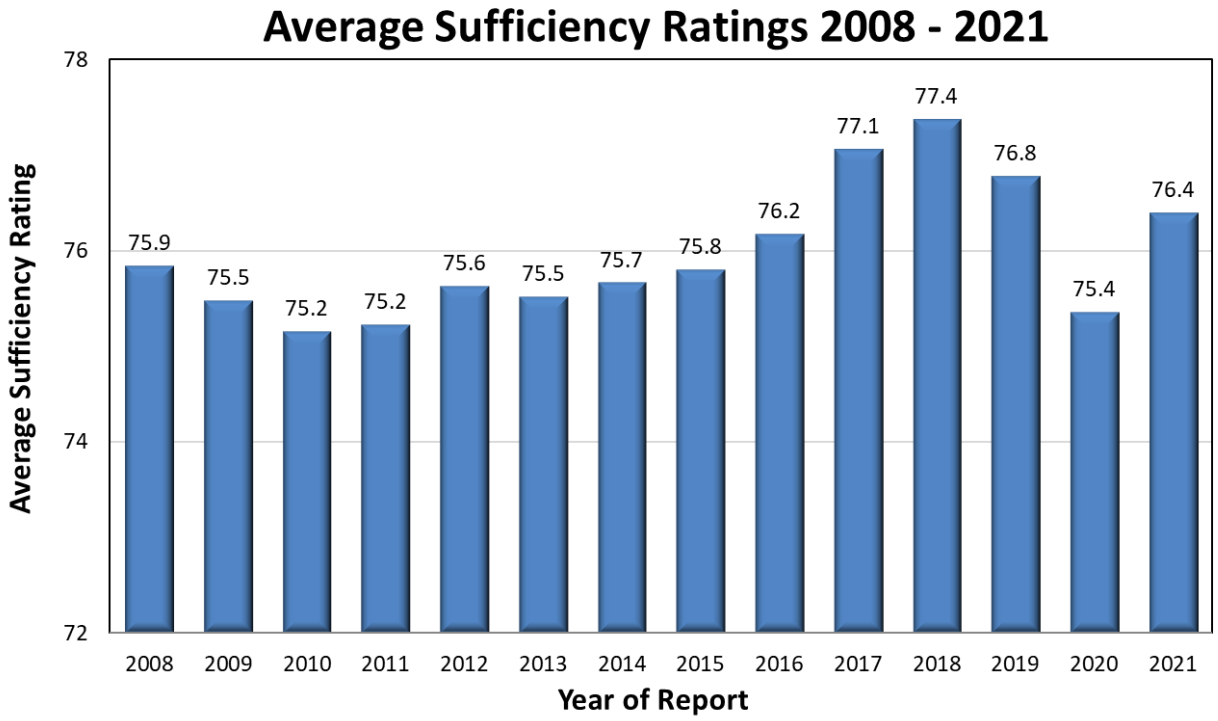


Figure 2: Average Annual Sufficiency Rating (SR) Clark County's Bridges

Figure 3 presents a pie chart of the age of the county bridges, in which the bridges were divided into four general categories: (1) less than 25 years old, (2) between 25 and 49 years old, (3) between 50 and 74 years old, and (4) over 75 years old. Approximately, 6 out of every 10 bridges (58%) were built over 50 years ago indicative of an aging bridge inventory in Clark County.

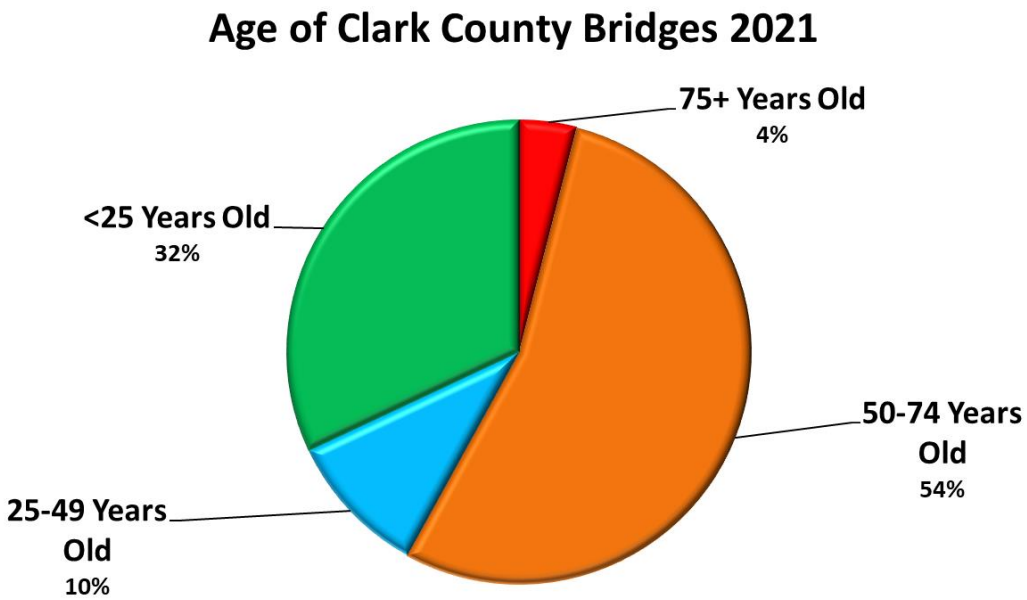


Figure 3: Distribution of Clark County's Bridges by Age

Generally speaking, bridges with an SR greater than 50 have a fair amount of useful life remaining. Bridges with an SR less than 50 require more attention and may need major repairs or complete replacement. The Bridge Replacement Advisory Committee, a WSDOT-sponsored committee that helps determine how to allocate federal bridge funds, is only screening bridges with an SR of 40 or less for replacement eligibility and an SR of 80 or less for rehabilitation eligibility. Although the current SR for the overall county inventory is 75.4, there are four (4) individual bridges with an SR below 50 and one of those with SR below 40. There is a direct correlation between the SR and the age of the bridge. The average SR rating will begin to decline if bridge maintenance and repairs needs are not addressed.

In addition to using the SR as a bridge condition measure, the NBIS defines two types of deficient bridges – **structurally deficient** and **functionally obsolete.**

A ***structurally deficient bridge,*** as defined by the FHWA, is one with a condition or design that has affected its ability to carry its intended traffic loads. An example is a bridge that has significant load carrying elements in poor condition due to deterioration or damage. Another example is a bridge with an inadequate waterway opening underneath that causes flooding over the bridge deck or adjacent roadway, triggering significant traffic disruptions. The fact that a bridge is “structurally deficient” does not mean the bridge is unsafe or likely to collapse. It does, however, indicate the bridge typically will require significant maintenance and repair to remain in service and ultimately will require replacement or major rehabilitation. Clark County currently has three (3) bridges that are listed as structurally deficient (SD).

A ***functionally obsolete bridge*** is one in which the deck geometry, load carrying capacity, clearance or approach roadway alignment does not meet accepted design standards. While structural deficiencies are generally the result of deterioration of bridge components, functional obsolescence typically results from older bridge configurations that are subject to increased traffic demands and are substandard structures, as defined by current bridge design codes. Examples include narrow lane/ shoulder widths and height restrictions of less than 14 feet. Clark County’s inventory currently has 14 bridges that are listed as Functionally Obsolete (FO).

IV. RESTRICTED BRIDGES

If a bridge deficiency is severe and repairs cannot restore full load capability, load restriction signs for trucks are posted at each end of the bridge. Recent federal regulations have required that load ratings be updated to include Special Hauling Vehicles (SHV), including single unit vehicles SU4, SU5, SU6, and SU7, and emergency vehicles (EV), including single (EV2) and tandem (EV3) vehicles. Currently, three county bridges are height-restricted, and 18 county bridges are weight-restricted as presented below in Table 2. Figure 4 presents the weight restrictions currently posted for Morgan Bridge No. 213.

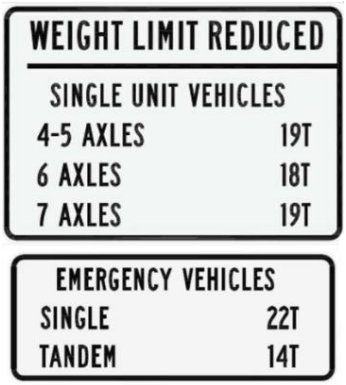


Figure 4: Morgan Bridge No. 213 weight restrictions

Currently 9 bridges (highlighted in yellow in the below table) are scheduled to be structurally strengthened during the summer of 2021, which would result in the removal of the load restrictions. Additionally, 4 more bridges (highlighted in green in the below table) were awarded grants in 2021 to receive structural strengthening.

Table 2: Height and Load Limited Bridges in Clark County

Bridge Name	Bridge No.	Action
CCRR Undercrossing – Old 99	20141	Height Restricted
Grist Mill	69	Height Restricted
BNRR – Marine Park Way OC	99906-05	Height Restricted
Gibbons Creek	6	Weight Restricted
Whipple Creek	11	Weight Restricted
Knapps Station	12	Weight Restricted
Flatwood	30	Weight Restricted
Pleasant Valley	33	Weight Restricted
Carson	63	Weight Restricted
Rock Creek	96	Weight Restricted
Lucia Falls	116	Weight Restricted
Matney	168	Weight Restricted
Matney South	169	Weight Restricted
Brush Prairie	201	Weight Restricted
JC Ward	212	Weight Restricted
Morgan	213	Weight Restricted
Venersborg	217	Weight Restricted
167th Morgan	222	Weight Restricted
172nd Avenue	229	Weight Restricted
Van Atta	275	Weight Restricted
Landon	299	Weight Restricted

V. BRIDGE CONSTRUCTION/ACCOMPLISHMENTS IN 2021

1. Clark County completed load rating evaluations on all National Bridge Inventory (NBI) Bridges.

2. Clark County started Load rating evaluations of non-NBI Bridges.

3. Clark County replaced 3 undersized culverts along Manley Road with NBI fish passable culverts.

4. Clark County has completed the design phase and is scheduled, during the summer of 2022, to structurally strengthen nine load-restricted bridges: (i) Gibbons Creek Bridge No. 6, (ii) Flatwood Bridge No. 30, (iii) Rock Creek Bridge No. 96, (iv) Lucia Falls Bridge No. 116, (v) Matney Bridge No. 168, (vi) Morgan Bridge No. 213, (vii) Venersborg No. 217, (viii) 167th Morgan Bridge No. 222, and (ix) Landon Bridge No. 299. The purpose of this project is to eliminate load restrictions on these bridges.

5. Clark County was awarded a total amount of $5,517,100 in grants to: (i) structurally strengthen 4 bridges (Whipple Creek No. 11, Knapps Station No. 12, Carson Bridge No. 63, and Matney South No. 169), and (ii) perform scour rehabilitation work on 2 bridges (Matney South No. 169 and Day Break Bridge No. 273).

6. Clark County completed the design plans and specifications for the replacement of Davis Bridge No. 232 to address a critical scour issue. The construction is scheduled for the summer of 2022 based on current availability of funds and grants.

7. Clark County installed 3 real-time floor monitoring sensors at Daybreak Bridge No. 273 on East Fork Lewis River, Van Atta Bridge No. 275 on Salmon Creek, and Little Washougal Blair Bridge No. 307 on Little Washougal River.

VI. FUTURE PLANS

- Continue to submit for grants to rehabilitate and/or replace the aging bridge infrastructure.

- Continue to support Parks and Railroad with their bridge needs. Facilitate the monitoring and assessment of their bridges and offering engineering support services as needed.

- Clark County will begin in 2022 the design phase of rehabbing / structurally strengthening four additional load-restricted bridges: (i) Whipple Creek Bridge No. 11, (ii) Knapps Station Bridge No. 12, (iii) Carson Bridge No. 63, and (iv) Matney South Bridge No. 169.

- Coordinate bridge barrier-railing upgrades with requirements for guardrail improvements by identifying safety needs.

- Enhance emergency preparedness. Plan and practice exercises will be developed.

- Continue to perform load-rating evaluations on all non-NBI bridges. Most of these bridges are near or past their design life.

- Complete the 9-bridge strengthening project during the summer of 2022.

- Reconstruct Davis Bridge No. 232 to address critical scour concerns.
- Develop priority matrix to programmatically address identified bridge concerns.

GLOSSARY OF BRIDGE TERMINOLOGY

Abutment: a substructure supporting the end of a single span, or the extreme end of a multi-span superstructure and, in general, retaining or supporting the approach fill.

Backwall: the top-most portion of an abutment functioning primarily as a retaining wall to contain approach roadway fill.

Bent: a supporting unit of the beams of a span made up of one or more column or column-like members connected at their top-most ends by a cap, strut, or other horizontal member.

Bridge Replacement Advisory Committee: a WSDOT-sponsored committee that helps determine how to allocate federal bridge funds.

Bracing: a system of tension or compression members or a combination of these, connected to the parts to be supported or strengthened by a truss or frame. It transfers wind, dynamic, impact, and vibratory stresses to the substructure and gives rigidity throughout the complete assemblage. Can also refer to diagonal members that tie two or more columns of a bent together.

Cap: the horizontally-oriented, top-most piece or member of a bent serving to distribute the beam loads upon the columns and to hold the beams in their proper relative positions.

Chord: in a truss, the upper-most and the lower-most longitudinal members, extending the full length of the truss.

Compression: a type of stress involving pressing together; tends to shorten a member; opposite of tension.

Deck: portion of a bridge that provides direct support for vehicular and pedestrian traffic.

Elastomeric pads: rectangular pads made of neoprene, found between the sub- and superstructure that bears the entire weight of the superstructure. Elastomeric pads can deform to allow for thermal movements of the superstructure.

Endwall: the wall located directly under each end of a bridge that holds back approach roadway fill. The endwall is part of the abutment.

Fracture critical member: a member in tension or with a tension element whose failure would probably cause a portion of or the entire bridge to collapse.

Pier: a structure comprised of stone, concrete, brick, steel, or wood that supports the ends of the spans of a multi-span superstructure at an intermediate location between abutments. A pier is usually a solid structure as opposed to a bent, which is usually made up of columns.

Pile: a rod or shaft-like linear member of timber, steel, concrete, or composite materials driven into the earth to carry structure loads into the soil.

Pinpile: a series of two-inch-diameter pipes driven in a line into the ground to support the timber planks of a small retaining wall, typically used to prevent erosion under a bridge abutment.

Post or column: a member resisting compressive stresses, in a vertical or near vertical position.

Scour: erosive action of removing streambed material around bridge substructure due to water flow. Scour is of particular concern during high-water events.

Short span bridge: the characteristics of these bridges are a span less than 20 feet and typically supported by timber piles or shallow concrete footings.

Soffit: the underside of the bridge deck or sidewalk.

Spall: a concrete deficiency wherein a portion of the concrete surface is popped off from the main structure due to the expansive forces of corroding steel rebar underneath. This is especially common on older concrete bridges.

Stringer: a longitudinal beam (less than 30’ long) supporting the bridge deck, and in large bridges, framed into or upon the floor beams.

Sufficiency rating: the sufficiency rating is a numeric value from 100 (a bridge in new condition) to 0 (a bridge incapable of carrying traffic). The sufficiency rating is the summation of four calculated values: Structural Adequacy and Safety, Serviceability and Functional Obsolescence, Essentiality for Public Use, and Special Reductions.

Substructure: the abutment, piers, grillage, or other structure built to support the span or spans of a bridge superstructure and includes abutments, piers, bents, and bearings.

Superstructure: the entire portion of a bridge structure which primarily receives and supports traffic loads and in turn transfers the reactions to the bridge substructure; usually consists of the deck and beams or, in the case of a truss bridge, the entire truss.

Tension: type of stress involving an action which pulls apart.

Trestle: a bridge structure consisting of beam spans supported upon bents. Trestles are usually made of timber and have numerous diagonal braces, both within each bent and from bent to bent.

UBIT: Under Bridge Inspection Truck

Wheelrail: a timber curb fastened directly to the deck, most commonly found on all-timber bridges.

Wingwall: walls that slant outward from the corners of the overall bridge that support roadway fill of the approach

APPENDIX TO THE 2020 ANNUAL BRIDGE REPORT

Table A – Bridge Inventory Detail
Table B – Bridge Condition Summary
Table C – Bridge Repairs

Table A - Bridge Inventory Detail

Bridge No.	Bridge Name	Facilities Carried	Year Built	Year Rebuilt	Sufficiency Rating	Structurally Deficient (SD) / Functionally Obsolete (FO)	Scour Code	Load Posted	NBI Structure
0001	KLINELINE	NE Hwy 99	2008	N/A	96.15	-	8	Open, No Restriction	Y
0002	FELIDA	NW SEWARD ROAD	1985	N/A	88.07	-	8	Open, No Restriction	Y
0006	GIBBONS CREEK	SE EVERGREEN WAY	1940	N/A	66.7	-	5	Posted for Load Restrictions	Y
0011	WHIPPLE CREEK	NW 179 TH ST	1963	N/A	66.65	-	5	Posted for Load Restrictions	Y
0012	KNAPPS STATION	NW KRIEGER RD	1962	N/A	79.18	-	5	Posted for Load Restrictions	Y
0013	BURNT BRIDGE CREST	NE HAZEL DELL AVE	1996	N/A	87.88	-	N	Open, No Restriction	Y
0026	BETTS	NE Salmon Creel Av	2006	N/A	99.3	-	8	Open, No Restriction	Y
0030	FLATWOOD	NE 239TH ST	1935	1951	66.27	-	4	Posted for Load Restrictions	Y
0032	KNOWLES	NE SALMON CREEK AV	1963	N/A	79.9	-	5	Open, No Restriction	N
0033	PLEASANT VALLEY	NE 50TH AVE	1960	N/A	59.76	FO	7	Posted for Load Restrictions	Y
0036	WILSON	NE 72ND AVE	1994	N/A	78.67	-	8	Open, No Restriction	Y
0039	GLENWOOD	NE 139TH ST	1936	1955	70.43	-	5	Open, No Restriction	N
0051	DOLLAR'S CORNER	72ND AVE	2015	N/A	96.43	-	5	Open, No Restriction	Y
0054	HUBER	NE 259TH ST	1940	1951	63.38	-	5	Open, No Restriction	N
0056	PIONEER	NE 259TH ST	1941	1951	68.54	-	3	Open, No Restriction	N
0059	BRATTON (CATTLE PASS)	NE JENNY CREEK RD	1956	N/A	76.16	-	5	Open, No Restriction	N
0063	CARSON	NE 67TH AVE	1957	N/A	57.65	-	5	Posted for Load Restrictions	Y
0065	CEDAR CREEK	NE Etna Road	2017	N/A	99.91	-	8	Open, No Restriction	Y
0069	GRIST MILL	GRIST MILL RD	1994	N/A	83.95	-	5	Open, No Restriction	Y
0075	DAYTON	CEDAR CREEK RD	1930	1955	67.2	FO	7	Open, No Restriction	Y
0094	BLAKER	NE 142 AVE	1953	N/A	77.77	-	5	Open, No Restriction	N
0096	ROCK CREEK	ROCK CRK RD	1949	N/A	66.01	FO	5	Posted for Load Restrictions	Y
0100	HEISSON	NE 172ND AVENUE	1999	N/A	97.27	-	8	Open, No Restriction	Y
0102	KEPFER	J R ANDERSON RD	1959	N/A	71.1	-	3	Open, No Restriction	Y
0107	JA MOORE	J A MOORE RD	1932	1954	73.51	-	8	Open, No Restriction	N
0108	HEITMAN	J A MOORE RD	1930	1958	62.28	FO	5	Open, No Restriction	Y
0116	LUCIA FALLS	NE HANTWICK RD	1937	2005	63.75	-	8	Posted for Load Restrictions	Y
0120	BIG TREE CREEK	LUCIA FALLS ROAD	1940	1959	75.18	-	4	Open, No Restriction	Y
0127	ARCH MCKEE	NE GERBER MCKEE RD	1934	1958	72.66	-	3	Open, No Restriction	N
0167	VANCAMP	NE 217TH AVE	1991	N/A	98.82	-	5	Open, No Restriction	Y
0168	MATNEY	NE 68TH ST	1938	1955	47.81	SD	8	Posted for Load Restrictions	Y
0169	MATNEY SOUTH	NE 232ND AVE	1930	1953	46.57	-	3	Posted for Load Restrictions	Y
0196	WASHOUGAL RIVER	NE VERNON RD	1998	N/A	87.61	FO	8	Open, No Restriction	Y
0201	BRUSH PRAIRIE	NE 156TH ST.	1960	N/A	77.02	-	7	Posted for Load Restrictions	Y
0203	BOULDER CREEK	NE LESSARD ROAD	1960	N/A	73.04	-	3	Open, No Restriction	N
0211	SMITH	NE 167TH AVE	1963	N/A	79.51	-	7	Open, No Restriction	Y
0212	JC WARD	NE 182ND AVE	1960	N/A	68.49	FO	7	Posted for Load Restrictions	Y
0213	MORGAN	NE 182ND AVE	1956	N/A	43.79	SD	4	Posted for Load Restrictions	Y
0216	JOHN OTT	RISTO RD	1958	N/A	76.58	FO	8	Open, No Restriction	Y
0217	VENERSBORG	NE RISTO ROAD	1941	1954	52.79	FO	5	Posted for Load Restrictions	Y
0222	167TH MORGAN	NE 167TH AVE	1954	N/A	54.79	FO	5	Posted for Load Restrictions	Y

Table A - Bridge Inventory Detail

Bridge No.	Bridge Name	Facilities Carried	Year Built	Year Rebuilt	Sufficiency Rating	Structurally Deficient (SD) / Functionally Obsolete (FO)	Scour Code	Load Posted	NBI Structure
0225	DUDLEY	NE 199TH ST	1962	N/A	89.33	-	8	Open, No Restriction	Y
0229	172 ND AVE	172nd Ave	2009	N/A	78.01	-	8	Posted for Load Restrictions	Y
0230	FIFTH PLAIN CREEK	NE 88th Street	2016	N/A	99.76	-	8	Open, No Restriction	Y
0231	CHINA DITCH	NE Ward Road	2009	N/A	98.53	-	8	Open, No Restriction	Y
0232	DAVIS	NE DAVIS RD.	1935	1953	7.86	-	2	Open, No Restriction	N
0242	LEWIS RIVER	DOLE VALLEY ROAD	1961	N/A	74.46	-	8	Open, No Restriction	Y
0244	ROCK CREEK DOLE	DOLE VALLEY ROAD	1975	N/A	69.51	FO	5	Open, No Restriction	Y
0252	BLAIR ZEEK	NE BLAIR RD	1961	N/A	68.51	FO	5	Open, No Restriction	Y
0261	119TH CHINA	NE 119TH ST	1935	1949	81.23	-	5	Open, No Restriction	N
0266	ALLWORTH	ALLWORTH RD.	1954	N/A	65.78	-	3	Open, No Restriction	N
0267	CRESAP	CRESAP RD	1956	N/A	77.39	-	5	Open, No Restriction	N
0272	202ND SHANGHAI	NE 202ND AVE.	1961	N/A	71.52	-	5	Open, No Restriction	N
0273	DAYBREAK	DAYBREAK ROAD	1966	N/A	68.64	-	3	Open, No Restriction	Y
0274	SHANGHAI CREEK	NE 212TH AVE	1955	N/A	74.64	-	4	Open, No Restriction	N
0275	VAN ATTA	NE 112TH AVE.	1960	N/A	59.52	-	3	Posted for Load Restrictions	Y
0294	LEHTO	NE LEHTO RD	1972	N/A	55.62	FO	3	Open, No Restriction	Y
0299	LANDON	CC LANDON ROAD	1955	N/A	53.17	SD	4	Posted for Load Restrictions	Y
0307	LITTLE WASHOUGAL BLAIR	SE BLAIR ROAD	1930	1959	68.83	-	5	Open, No Restriction	Y
0308	BONNEVILLE	NE 222TH AVE	1955	N/A	77.47	-	3	Open, No Restriction	N
0326	N.E. 2ND AVENUE	N.E. 2ND AVENUE	1985	N/A	85.93	-	5	Open, No Restriction	Y
0327	ALKI ROAD	ALKI ROAD	1985	N/A	80.38	-	4	Open, No Restriction	Y
0330	PADDEN	NE 107TH AVENUE	1999	N/A	97.82	-	N	Open, No Restriction	Y
0331	SALMON CR	Caples Road	1923	N/A	77.01	FO	7	Open, No Restriction	Y
0332	WOODIN CREEK BRIDGE	STATE ROUTE 503	1900	N/A	82.22	-	3	Open, No Restriction	N
0337	LA LONDE CULVERT	NE 119TH AVENUE	2003	N/A	84.78	-	5	Open, No Restriction	Y
0338	SALMON CREEK CULVERT	NE SALMON CREEK AV	2002	N/A	81.85	-	5	Open, No Restriction	N
0339	PADDEN WEST CULVERTS	PADDEN PARKWAY	2003	N/A	81.69	-	8	Open, No Restriction	N
0340	JOHN CREEK CULVERT	CEDAR CREEK ROAD	1999	N/A	80	-	5	Open, No Restriction	N
0341	AMBOY/CEDAR CRK CULVERT	Amboy Road	1999	N/A	81.44	-	4	Open, No Restriction	Y
0342	ROCKWELL CREEK	N E 23RD AVE	2004	N/A	87.2	-	9	Open, No Restriction	Y
0343	CURTAIN CREEK CULVERT	NE 119th Street	2015	N/A	97.42	-	8	Open, No Restriction	Y
0344	CARTY ROAD CULVERT	NW Carty Road	2016	N/A	99.43	-	8	Open, No Restriction	Y
0345	NE 10TH AVE	NE 10TH AVE	2018	N/A	99.64	-	9	Open, No Restriction	Y
1406	LITTLE WASHOUGAL	WASHOUGAL RIVER RD	1949	N/A	64.93	FO	5	Open, No Restriction	Y
1409	COUGAR CREEK	Washougal River Rd	2012	N/A	94.08	-	8	Open, No Restriction	Y
0900D	MANLEY NORTH CULVERT	NE MANLEY ROAD	2020	N/A	100	-	8	Open, No Restriction	Y
0901C	MANLEY MIDDLE CULVERT	NE MANLEY ROAD	2020	N/A	100	-	8	Open, No Restriction	Y
0902C	MANLEY SOUTH CULVERT	NE 92ND AVE	2021	N/A	100	-	8	Open, No Restriction	Y
0320P	NW 149TH PED BRIDGE	PEDESTRIAN BRIDGE	2005	N/A	N/A	-	8	Open, No Restriction	N
205/30P	PADDEN PARKWAY PED BR	PEDESTRIAN BR	2003	N/A	N/A	-	N	Open, No Restriction	Y

Table B - Bridge Condition Summary

Agency	Total Bridges in Program	Bridge Condition			Structurally Deficient[4]	Functionally Obsolete[5]	Scour Critical[6]	Fracture Critical[7]
		Good[1]	Fair[2]	Poor[3]				
Clark County	79	61	17	1	3	14	12	0

Notes:

1 - Good corresponds to a Sufficiency Rating between 99.9 and 66.7.

2 - Fair corresponds to a Sufficiency Rating between 66.6 and 33.3.

3 - Good corresponds to a Sufficiency Rating between 33.2 and 0.

4 - Structurally Deficient - Impacted ability to carry intended traffic loads.

5 - Functionally Obsolete - Narrow structure and geometry are not based on current standards.

6 - Scour Critical - Foundations considered unstable, shallow, or stream is undermining stability of structure. Requires more extensive monitoring and inspection during and after flood events.

7 - Fracture Critical - Defined as a structure with 2 load paths with steel members in tension, could cause immediate catastrophic failure if member fail. Requires more extensive inspection and testing.

Table C - Bridge Repairs

Structure ID	Bridge No.	Bridge Name	Repair ID
08227700	0075	DAYTON	Guardrail and terminals are damaged, missing blocks and substandard and low, consider full replacement
			Patch bridge deck spall (3'x4') with cementitious product on SB lane.
08649000	0100	HEISSON	Consider improving drainage on north end. Curb is trapping water behind abutment.
08644100	0196	WASHOUGAL RIVER	Repair Membrane and Patch Road
			When was this deck overlay last replaced? Consider full replacement with new membrane.
08142300	0211	SMITH	Sawcut pavement and install elastomeric butt joint, both sides of bridge
			remove recreational rock dam on downstream side of bridge. may be cause of erosion on south bank.
08068100	0212	JC WARD	Installing missing deadend bearing plate on deadend assembly on Girder 1B. Tighten double nuts on all restrainer rods on girders and at Pier 2. Check and adjust seismic restrainer gaps at Pier 2 to provide 2" gap.
08140500	0222	167TH MORGAN	place HMA to smooth out bumps at joints and lower impact on structure
08243300	0242	LEWIS RIVER	repair bridge approaches
			patch spalls on girder and cover exposed stirrups, near Abutment 1 on Girder B and other locations
08375000	0267	CRESAP	Remove boulder from under bridge.
08276000	0273	DAYBREAK	Add scour protection rock to upstream embankment area to protect Pier 1, the south abutment.
08121100	0299	LANDON	Remove beaver dam.
			Repair spall areas on the underside of deck (soffit).
08708900	0338	SALMON CREEK CULVERT	Provide gate to access downstream end of culvert.
08907000	0345	NE 10TH AVE	Clean drains and sweep bridge.

2021 Annual Bridge Report

Brian S. Vincent, P.E.

June 21, 2022

Outline

- **Introduction**
- **Bridge Inventory**
- **Bridge Inspection Findings and Repairs**
- **Restricted Bridges**
- **Bridge Construction/Accomplishments in 2021**
- **Future Plans**

Report Summary

Introduction

- This report is prepared to fulfill the requirements of the Washington Administrative Code (WAC) 136-20-060.
- This report summarizes the county's 2021 bridge program, activities, and findings.

Bridge Inventory

- There are 81 public bridges located throughout Clark County and owned/operated by Clark County:
  - 79 vehicular traffic bridges
  - 2 pedestrian bridges

Report Summary

Clark County Bridge Location Map

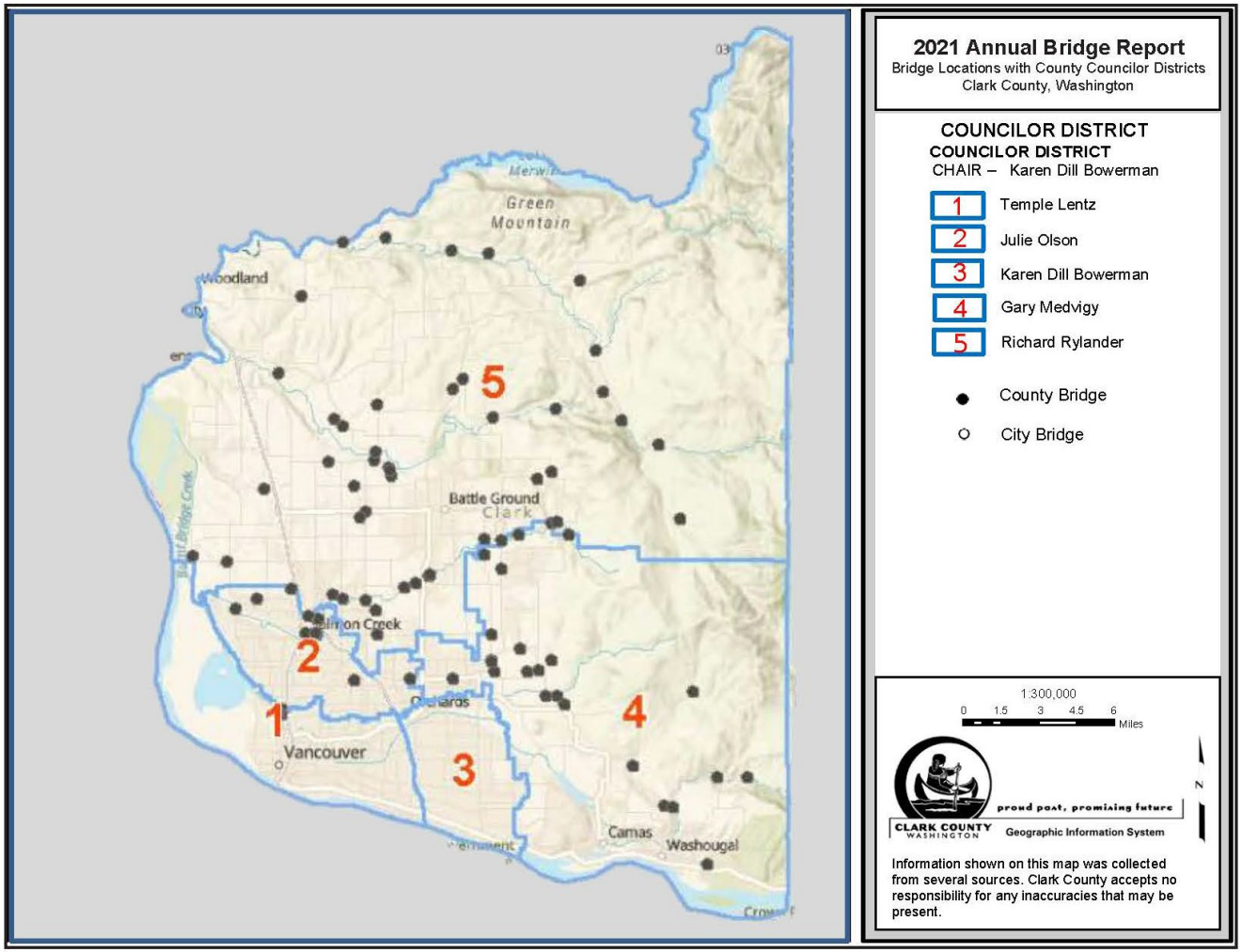


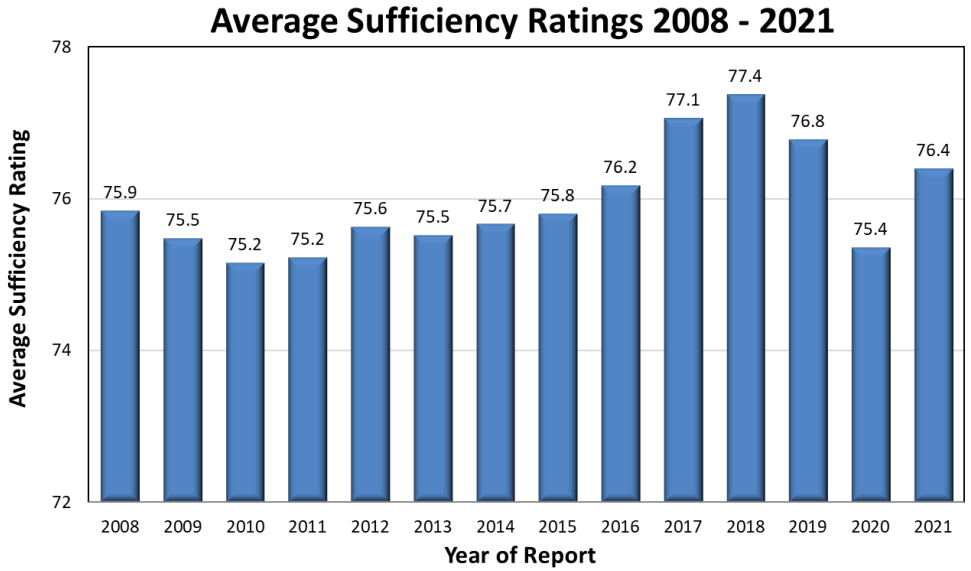
Figure 1 Clark County Bridge Locations Map

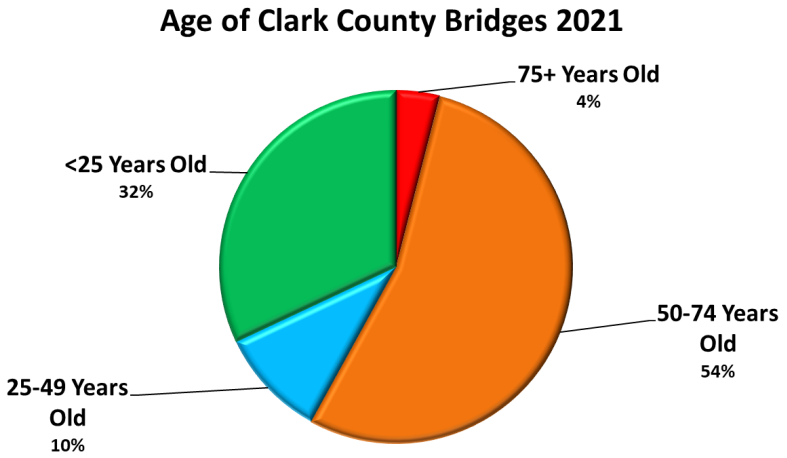
Report Summary

Bridge Inspection Findings and Repairs

- NBIS mandates that public agencies inspect and report on all bridges at least once every 24 months.

- A total of 43 bridge inspections were conducted in 2021.





Report Summary

Restricted Bridges

- Three (3) bridges are height restricted.
- Eighteen (18) county bridges are weight restricted.

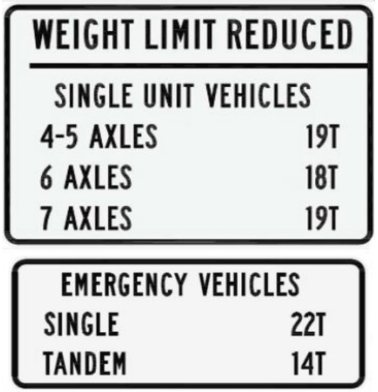


Figure 4: Morgan Bridge No. 213 weight restrictions

Table 2: Height and Load Limited Bridges in Clark County

Bridge Name	Bridge No.	Action
CCRR Undercrossing – Old 99	20141	Height Restricted
Grist Mill	69	Height Restricted
BNRR – Marine Park Way OC	99906-05	Height Restricted
Gibbons Creek	6	Weight Restricted
Whipple Creek	11	Weight Restricted
Knapps Station	12	Weight Restricted
Flatwood	30	Weight Restricted
Pleasant Valley	33	Weight Restricted
Carson	63	Weight Restricted
Rock Creek	96	Weight Restricted
Lucia Falls	116	Weight Restricted
Matney	168	Weight Restricted
Matney South	169	Weight Restricted
Brush Prairie	201	Weight Restricted
JC Ward	212	Weight Restricted
Morgan	213	Weight Restricted
Venersborg	217	Weight Restricted
167th Morgan	222	Weight Restricted
172nd Avenue	229	Weight Restricted
Van Atta	275	Weight Restricted
Landon	299	Weight Restricted

Scheduled for Strengthening in 2022

Strengthening Grant awarded in 2021

Report Summary

Bridge Construction/Accomplishments in 2021

- CC completed load rating on all National Bridge Inventory (NBI) Bridges.
- CC started Load rating evaluations of non-NBI Bridges.
- CC replaced 3 undersized culverts along Manley Road.
- CC has completed the design phase and is scheduled, during the summer of 2022, to structurally strengthen nine load-restricted bridges. The purpose of this project is to eliminate load restrictions on these bridges.
- CC was awarded a total amount of $5,517,100 in grants to: (1) structurally strengthen 4 bridges, and (2) perform scour rehabilitation work on 2 bridges.
- CC completed the design plans and specifications for the replacement of Davis Bridge No. 232 to address a critical scour issue. The construction is scheduled for the summer of 2022.
- CC installed 3 real-time flood monitoring sensors at Daybreak Bridge No. 273, Van Atta Bridge No. 275, and Little Washougal Blair Bridge No. 307.

Future Plans

- Apply for grants to rehabilitate and/or replace the aging bridge infrastructure.
- Support Parks and Railroad with their bridge needs. Facilitate the monitoring and assessment of their bridges and offering engineering support services as needed.
- CC will begin in 2022 the design phase of rehabilitating / structurally strengthening four additional load-restricted bridges and scour mitigation of two bridges.
- Coordinate bridge barrier-railing upgrades with requirements for guardrail improvements by identifying safety needs.
- Enhance emergency preparedness. Plan and practice exercises will be developed.
- Complete the 9-bridge strengthening project during the summer of 2022.
- Develop priority matrix to programmatically address identified bridge concerns.

Thank you!

Comments and questions

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